

EFFECTS OF FEEDBACK CONTENT  
AND PREFERENCE ON PERFORMANCE

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A Thesis  
presented to  
the Faculty of the Graduate School  
at the University of Missouri-Columbia

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In Partial Fulfillment  
of the Requirements for the Degree  
Master of Science  
in Applied Behavior Analysis

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by  
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The undersigned, appointed by the Associate Vice Chancellor of the Office of Research and Graduate Studies, have examined the thesis entitled

EFFECTS OF FEEDBACK CONTENT  
AND PREFERENCE ON PERFORMANCE

presented by Alexander Clark Schalla,

a candidate for the degree of master of

science in applied behavior analysis,

and hereby certify that, in their opinion, it is worthy of acceptance.

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## LIST OF ABBREVIATIONS

ABA	Applied Behavior Analysis
ASD	Autism Spectrum Disorders
FSPA	Feedback Stimulus Preference Assessment
IOA	Interobserver Agreement
OBM	Organizational Behavior Management

## **ABSTRACT**

Data were collected on individual task completion and feedback procedures and stimuli used to change performance in existing feedback interventions. The information collected aimed to improve the quality of feedback delivered to direct care staff at a clinic specializing in the treatment of autism and neurodevelopmental disorders. A feedback stimulus preference assessment (FSPA) was administered to identify preferred feedback components commonly used in feedback interventions. Preference assessment data collection consisted of a paired choice and ranking procedure on feedback components including content, modality, recipients, and immediacy. Feedback delivery was altered and delivered based on preference to improve task completion rates (i.e., performance). Performance was based on a checklist of session-related duties direct care staff were required to complete during client appointments. Results from this study indicate that preferred and detailed, behavior-specific, affirmative feedback may be effective at improving rates of individual task completion.

*Keywords:* affirmative feedback, corrective feedback, feedback intervention, performance feedback, performance management, task completion

## Introduction

Feedback is researched through a wide variety of fields of study and is commonly used in organizational and clinical settings to produce behavior change in individuals. As a topic of mathematical models in multi-loop feedback systems (Doyle, 1982), feedback systems have a history in engineering and control systems (Bennett, 1996; Doyle et al., 2013; Podsakoff & Farh, 1989). Feedback processes have also been studied in the fields of cybernetics (Ashby, 1956), operant conditioning (Fetz, 1969), and biology and biofeedback (Hermann & Blanchard, 2002; Mandler et al, 1958). While theoretical models of feedback loop systems have been mostly researched in math and engineering, behavioral applications of feedback systems have been developed for organizations (Prue & Fairbank, 1981). Additionally, the clinical applications of behavior analysis have been refined to meet the needs of healthcare providers and organizational consultants (Dougher & Hayes, 2000; Fisher et al., 2011; Kohlenberg et atl, 1993).

Applied behavior analysis (ABA) is an applied science practiced by behavior analysts and technicians who use technologies derived through the experimental analysis of behavior to implement interventions that lead to a socially significant improvement in individual behavior (Baer, Wolf, & Risley, 1968). As early as 1999, the United States Surgeon General recognized the efficacy of applied behavior analysis and early intervention in reducing problem behavior and increasing learning, communication, and appropriate social behavior (USDHHS, 1999). Subsequent literature reviews and randomized controlled trials have further demonstrated the usefulness of ABA therapy in the treatment of autism spectrum disorders known as ASD (Dawson & Burner, 2011; Dawson et al., 2010).

Ensuring that high-quality services are provided efficiently is a growing concern to healthcare organizations in part due to legislation requiring coverage of medically necessary

services for individuals with developmental disabilities (Wang et al., 2019). Because of this, there is increased pressure on service providers to ensure consistent delivery of high-quality services while considering the cost of program delivery (Leigh & Du, 2015; NCSL Brief, 2011). Fortunately, in addition to the clinical application of behavior analysis, a growing body of literature and studies have addressed Organizational Behavior Management (OBM) to improve socially significant behavior in the workplace (Mawhinney, 1999; Sturmey, 1998).

### **Performance Management and Supervisory Feedback**

As a growing number of individuals seek and deliver ABA treatment, professional organizations have worked to ensure standards of practice and service delivery. According to reports conducted for the regulatory board that credentials behavior analysts, the master's level credential has seen an approximate 800% increase in demand from 2010-2017 (Burning Glass Technologies, 2018). This rapid growth of prospective behavior analysts seeking certification has created a dire need for effective, efficient supervision; however, many behavior analysts do not receive adequate supervisory training despite expectations to supervise graduate trainees (Deochand & Fuqua, 2016; LeBlanc & Luiselli, 2016). Furthermore, a survey of staff-training and performance management practices identified that feedback procedures used in applied settings found employers are not consistently adopting best-practice in-service or pre-service training (DiGennaro-Reed & Henley, 2015).

Best practices such as behavioral skills training has been developed as a technology to improve performance in clinic-related tasks (Sarokoff & Sturmey, 2004). A vital component of behavioral skills training consists of feedback. Therefore, it is important to create supervision models and feedback systems that aid in the delivery of effective supervision (LeBlanc & Luiselli, 2016). Effective supervisory feedback systems are further supported by the *Ethical and*

*Compliance Code for Behavior Analysts* (2014) and *RBT Task List* (2016), which outlines the scope of practice and core tasks performed by behavior technicians. The ethical code addresses providing feedback to supervisees in section 5.06 and states:

Behavior analysts design feedback and reinforcement systems in a way that improves supervisee performance. Behavior analysts provide documented, timely feedback regarding the performance of a supervisee on an ongoing basis (BACB, 2014).

This ethical obligation outlines the necessity for templates to standardize feedback delivery and create systems that monitor, track, and graph of the effect of feedback interventions. As defined by Peterson (1982) feedback is simply “information about past performance” (p. 101). The author further suggests that feedback is nothing more than “professional slang” and should no longer be used. Therefore, it is important that *feedback* and *feedback interventions* be analyzed in a way that is discernable between a specific *feedback stimulus* and the process of a *feedback procedure*. By analyzing feedback interventions in terms of basic behavioral principles of reinforcement and punishment, or systematic procedures with component sub-processes, a more functional use of feedback terminology can be used for academic study.

### **Performance Feedback Interventions**

An early study identified feedback as “information about the gap between the actual level and the reference level of a system parameter which is used to alter the gap in some way” (Ramaprasad, 1983, p.4). A later meta-analysis of feedback interventions provided a preliminary framework for researchers to conduct behavioral research on feedback interventions (Kluger & DeNisi, 1996). The authors suggest that feedback interventions’ effects on performance are augmented by cues to the immediate task coupled with information about discrepancies between prior responses and expected performance (Kluger & DeNisi, 1996).

Recent literature reviews on feedback interventions have identified feedback as the delivery of feedback stimuli (which can be presented through various modalities) that vary along several dimensions and parameters of responding; or within a response dimension, or combination of response dimensions (Mangiapanello & Hemmes, 2015). More practically, a review of feedback in clinical education defined performance feedback as “specific information about the comparison between a trainee’s observed performance and a standard, given with the intent to improve the trainee’s performance” (Monica van de Ridder et al., 2008, p. 193).

Further descriptions of performance feedback procedures suggest “feedback is a verbal (written or vocal) description of performance, providing information regarding the quality and/or quantity of the performer’s behavior,” (Aljadeff-Abergel et al., 2017, p.171; Alvero, Bucklin, & Austin, 2001; Cooper, Heron, & Heward, 2007), or operationalize and define feedback as a set of procedures that include a source (e.g. supervisor or peer); medium, mechanism, or form (e.g., graphic, verbal, written); frequency (e.g., daily, weekly monthly, annually); privacy (e.g., feedback delivered only to intended recipient); and can target specific participants (group or individual) and content (Alvero et al., 2001; Balcazar et al., 1985-1986).

The characteristics identified in these studies seek to standardize feedback delivery methods but are inconsistently (and often interchangeably) referred to as feedback components, forms, mediums, mechanisms, or modalities (Alvero et al., 2001). Because of this, there is still confusion about how feedback should be delivered (Henley & DiGennaro-Reed, 2015).

Additional research has worked to align feedback procedures with operant conditioning, where feedback was defined as the “presentation of an exteroceptive stimulus whose parameters vary as a function of parameters of antecedent responding,” (Mangiapanello & Hemmes, 2015, p. 54).

This definition suggests that feedback is a verbal response where specific performance feedback stimuli are delivered contingently upon any number of pre-determined criteria.

One study attempting to separate the discriminative and reinforcing functions of feedback on performance where performance feedback was given to adults conducting preference assessments with real and simulated clients. Feedback was defined as a procedure consisting of two components: 1) the delivery of a potential reinforcer; and 2) the delivery of information about correct or incorrect performance and was provided immediately between opportunities for responding (Roscoe et al., 2006, p. 64). The authors found that discriminative functions of feedback were more effective than when feedback was used as a reinforcing function (Roscoe et al., 2006). In this study, feedback was delivered immediately after the prior response and immediately prior to the subsequent response using scripts randomly rotated across sessions. However, feedback was delivered in close temporal proximity to the next opportunity to respond, and without a-priori analysis of feedback function, the findings were limited (Mangiapanello & Hemmes, 2015).

An applied study conducted by Aljadef-Abergel et al. (2017) evaluated the effects of delayed feedback on the accuracy of error correction procedures and rated praise statements of undergraduate students in a school setting. In this evaluation, researchers provided combined objective and evaluative feedback while manipulating the temporal location of feedback. The findings that temporal delays when delivering feedback have function-altering effects of feedback stimuli and that feedback stimuli with closer temporal proximity to future responding are likely to function as an antecedent stimulus for subsequent responding, rather than a consequence for prior responding (p. 191).

These findings are consistent with the aforementioned preliminary feedback intervention theories further indicating that feedback likely serves a number of behavioral functions including acting either as an antecedent event (e.g., discriminative stimulus, instruction, guide, rule, or motivating operation) or consequent event (e.g., reinforcer or punisher; Mangiapanello & Hemmes, 2015). Because of this, differentially evaluating discriminative or function-altering effects of feedback as a verbal stimulus may lead to clearer applications of feedback procedures and interventions and delivery of specific feedback stimuli (Schlinger, 1993).

### **Feedback Preference**

Prior studies have evaluated the use of feedback interventions when implementing typical behavior analytic tasks, for example, stimulus preference assessments; (Roscoe et al., 2006). However, these researchers did not systematically assess preference for the feedback stimuli used during intervention. Prior literature on feedback interventions have been successful in providing more operational definitions of feedback, specifically performance feedback; however, to date, few studies have been published on assessing preference for feedback delivery. In order to examine feedback delivery procedures as verbal stimuli, it necessary to isolate feedback components and identify types of feedback stimulus content.

Using preferred feedback may increase rates of correct performance and target responding. For instance, utilizing preferred feedback methods may assist in individuals with difficulty in accepting feedback or not responding well to feedback (Sellers et al., 2016). Some researchers have identified a preference for graphic feedback over no feedback. (Bechtel et al., 2015; Sigurdsson & Ring, 2013) although no significant difference in performance or rate of skill acquisition was shown (Bechtel et al., 2015). Some researchers identified a preference for

graphic feedback for correct versus incorrect performance, however, this study only demonstrated preference for form (i.e., graphic feedback; Sigurdsson & Ring, 2013).

### **Types of Feedback**

Prior studies have identified types of feedback content that can be used in future analysis; for instance, objective feedback has been previously defined as “subjective information based on past behavior,” and evaluative feedback as “specific unbiased information about past behavior,” (Palmer et al, 2015, p. 208). A study conducted by Johnson (2013) separated these two components of feedback and evaluated the effects of evaluative and objective feedback stimuli using analogue tasks in laboratory conditions. Researchers found that combined objective and evaluative feedback stimuli were most effective at improving performance and further concluded that evaluative feedback likely has value-altering effects on objective feedback (Johnson, 2013). A later study further assessed the role of accuracy in evaluative feedback and found that supportive evaluative feedback (i.e., statements provided when performance improved) was more effective than critical evaluative feedback (i.e., statements when performance worsened; Johnson et al., 2015).

While content is considered a component of feedback, the specific properties of the content may have a function-altering effect on the feedback stimulus (Johnson, 2013). Because of this, it is necessary to conduct an a-priori assessment to identify any possible behavior-altering effects of consequential stimuli (Mangiapanello & Hemmes, 2015). Wine et al. (2014) found both survey and ranking assessments to be effective for identifying reinforcers and neutral or ineffective stimuli; therefore, a feedback stimulus preference assessment (FSPA) was developed for the purpose of this study to identify preference for five types of feedback content used in a feedback intervention.

Given that preference for performance feedback and preferred feedback stimuli have been rarely assessed or utilized in prior literature, the purpose of this study is to assess preference for common components of feedback procedures and types of feedback stimulus content and evaluate the effectiveness of preferred feedback at increasing task completion. Due to the ethical responsibility for behavior analysts to provide effective and efficient feedback delivery systems, it is especially important for practitioners to develop conceptually systematic feedback interventions in order to supervise graduate trainees and clinical practitioners.

### **Method**

Data were collected to improve the quality of feedback delivered to direct-care staff. Feedback based on preference was delivered to increase task completion rates. Staff preference and task completion data were collected and analyzed to identify specific stimuli used in a feedback intervention used by clinical supervisors to improve rates of independent task completion which were referred to as performance.

### **Participants & Setting**

Participants consisted of 11 direct-care staff that implement behavior change programs including behavior analysts, behavior technicians, and practicum students engaging in service delivery to clients. All 11 participants in this study were recruited through voluntary verbal agreement. All behavior technicians were both part-time employees and graduate students enrolled full-time in an intensive practicum site at their place of employment. Length of employment in the current role ranging from one month to one year, with experience implementing ABA ranging from one-three years. Behavior analysts were master's level practitioners with clinical and supervisory experience ranging from at least one year to six years. Behavior analysts verbally consented to participate as "Supervisor" participants in the dyad

while behavior technician participants consented electronically before completing the feedback stimulus preference assessment. Participants are further described in Table 1. An academic center-based outpatient treatment facility served as the primary site for the study. Specifically, an early intensive behavioral intervention (EIBI) clinical unit focusing on the treatment of autism and other developmental disorders was used as to conduct session audits and feedback sessions.

Table 1

*Participant Roles and Experience*

Participant	Role	Experience in Current Role	Supervisory Experience
Algernop	Peer Supervisor	2 years	None
Carol	Behavior Analyst	2 years	1.5 years
Cherlene	Behavior Technician	2 months	None
Cheryl	Behavior Analyst	2.5 years	4.5 years
Cyril	Behavior Technician	1 years	None
Katya	Behavior Technician	2 months	None
Lana	Behavior Technician	2 months	None
Mallory	Behavior Technician	2 months	None
Pam	Behavior Technician	1 years	None
Ray	Behavior Technician	2 years	None
Sterling	Behavior Technician	2 years	None

*Notes.* List of participants with corresponding roles in the study. Algernop was a behavior technician who delivered feedback for individuals with preferences for peer feedback.

**Interobserver agreement and treatment integrity.** The primary investigator collected primary data on session checklist completion and coded feedback delivery. Graduate students and behavior analysts were trained to collect data on the occurrence or nonoccurrence of tasks completed. Interobserver agreement (IOA) data were collected on feedback stimulus delivery and appointment checklist completion. IOA on the delivery of feedback stimuli and end-of-appointment session checklist completion were taken by three graduate students and a behavior

analyst for 29% of sessions. IOA was calculated using a within-session analysis of intervals scored per session with 88% exact interval agreement and 96% (range, 86%-100%) total overall agreement.

Treatment integrity data were collected for 92% of sessions using a feedback stimulus tracker created specifically for the feedback stimuli identified in the feedback stimulus preference assessment. Feedback delivery fidelity data were collected by comparing feedback stimuli delivered in feedback sessions with the preferred feedback stimuli identified in the FSPA. Feedback stimuli delivered during feedback sessions matching and directly corresponding to stimuli identified during the FSPA were scored using a feedback fidelity tracker in Appendix 1. Treatment integrity data averaged 98% (range, 80%-100%) across feedback sessions.

### **Feedback Stimulus Preference Assessment**

Using the framework of performance feedback as a verbal stimulus, a-priori establishment of any behavior-altering effects of consequential stimuli were identified as recommended by (Mangiapanello & Hemmes, 2015). A modified feedback stimulus preference assessment (FSPA) was created specifically for the purposes of this study and was administered prior to baseline data collection for the first four participants and after baseline data collection for the remaining four participants to identify preferred feedback stimuli to be used in preferred feedback sessions during intervention. A common online survey and web application was used to collect data for the FSPA. The survey began with a consent agreement to participate in the study and indicated data were to be shared with researchers and supervisors. Data were collected through the online survey using five questions. The first question was a text box for participants to provide their names for identification purposes. The next three questions consisted of a paired-stimulus choice for the source, modality, and immediacy of feedback. Preference for

immediacy was assessed because prior literature suggests the temporal location and use of combined objective and evaluative feedback stimuli were most effective at improving performance (Johnson, 2013). However, feedback stimuli with closer temporal proximity to future responding is likely to function as an antecedent stimulus for subsequent responding, rather than a consequence for prior responding (p. 191). For this reason, this study defined “immediate” as immediately after a session and “delayed” as immediately prior to the next session (opportunity for responding). For the purposes of clinical application, “immediate” feedback was coded when delivered within twenty-four hours of task completion. The last question contained a ranking procedure that required a forced distribution (Waldvogel & Dixon, 2008) and was used to evaluate preference for five types of feedback content. Feedback content were ranked using the following types of content: Objective feedback, supportive evaluative feedback, critical evaluative feedback, affirmative feedback, corrective feedback. The data collected through the feedback stimulus preference assessment was used to develop individualized performance feedback stimuli delivered in the feedback interventions.

Two common components of feedback were eliminated from the feedback stimulus preference assessment for the purposes of this study that led to a shortened modified FSPA. Preference for private and individual were not assessed and remained constant throughout the procedure. For example, participants did not receive public performance feedback (i.e., in front of clients, peers, and supervisors) or feedback on group performance allowing for more control over feedback sessions. Additionally, while previous literature has shown that graphic feedback (i.e., visually graphed data) is preferred and effective at improving performance (Sigurdsson & Ring, 2013), only vocal and written feedback were assessed during the feedback stimulus preference assessment. This decision was made due to vocal and written forms of feedback being most

commonly used in this particular clinical setting. Additionally, by examining performance feedback as verbal stimuli, graphed data contains a multitude of varying feedback stimuli. For example, performance graphs used in this study would provide *velocity feedback*, or information about the amount of change from previous performances which may “create a very clear feedback-standard discrepancy at the task level” (Kluger & DeNisi, 1996, p. 275). Therefore, vocal and written feedback were chosen to limit any value-altering effects that graphic feedback may have on objective feedback stimuli (Johnson, 2013).

## **Procedures**

Performance feedback stimuli was manipulated to assess the reinforcing effectiveness of the preferred feedback stimuli identified in the preference assessment. Baseline data were first collected on the performance tasks while receiving the feedback delivery methods that were currently in place. Session audit and feedback data were collected and coded by full-time graduate students. Baseline were conducted for a minimum of three performances, or until a stable pattern of responding was seen, to rule out any acquisition effects. If performance did not improve, behavior technicians were to be paired with credentialed behavior analysts into supervisor/supervisee dyads after three session audits with task a completion percentage below 70 percent.

Once baseline data were collected, the FSPA was administered to identify each participants’ highest-preferred feedback stimuli. Dyads were then selected based off the FSPA, supervisor availability, caseload, and supervision frequency. Supervising behavior analysts were provided with definitions of feedback stimulus content (i.e., objective, affirmative, corrective, supportive or critical evaluative) and were instructed to deliver feedback according to the supervisee’s preferred feedback combination. Feedback stimulus delivery was rehearsed with

supervising behavior analysts, however, feedback density (i.e., number comments or feedback stimuli) and specificity (e.g., behavior-specific details) were free to range according to supervisor discretion. Allowing for a larger range of feedback density or specificity provided more natural delivery of feedback stimuli for supervisors delivering affirmative and corrective feedback stimuli.

Feedback stimuli were delivered within 24 hours following a session. Feedback sessions were observed, filmed, and based on the performances from the preceding session. This may a) provide insight into the specific feedback stimuli being used along and b) any possible value-, function-, or behavior-altering effects of the feedback stimuli.

**Experimental design.** Because feedback stimuli permanently alter the environment and subsequent responding, dependent and independent variables were analyzed using a non-concurrent multiple baseline probe across three participant dyads. A multiple-baseline probe technique was utilized due to the applied setting of this study and was modified to accommodate supervisor/supervisee dyads which allowed the feedback source to remain constant throughout intervention.

### **Dependent Variables**

Performance was based on a checklist of seven session-related duties behavior technicians and direct care staff are required to completed at the end of each client session. All tasks are a normal part of clinical service delivery and were chosen because of low rates of completion. Audit data were scored using permanent product event recording on the occurrence or non-occurrence of seven writing tasks listed on the session checklist. All tasks were marked as complete or incomplete regardless of response opportunities. This method was used because team members on each client case were expected to complete the tasks regardless of individual

responsibility. For example, if a skill acquisition target was introduced by a behavior technician during the immediately prior session (i.e., 8AM-10AM shift of an 8AM-12PM client appointment), the technician in the following session (i.e., 10PM-12PM) was held accountable for entering the start date on the target list even though the first technician was “required” to do so. Because exact “start” and “mastered” dates for skill acquisition targets can be tracked through discrete trial data, this approach was chosen to establish personal responsibility regarding client progress tracking. Overall task completion rates were summarized as total percentage of tasks completed correctly from the items listed in Table 2:

Table 2

*Client Appointment Session Tasks*

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End-of-Appointment Session Checklist

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Read and initial any notes in front of binder

Enter start date for any introduced targets

Enter mastered date for any mastered targets

Make maintenance cards for mastered targets

Data sheets filled out with: programs listed correctly, targets described correctly, target data graphed/dated/initialed, mastered targets replaced with new targets

Old data sheets filed in correct spot

New blank data sheets prepared for next session

*Notes.* List of session tasks that are required to be completed at the end of each client appointment. For data sheets filled out to be marked as completed correctly, all four subtasks were required to be completed correctly.

## Independent Variables

A performance feedback tracker (see Appendix 1) specifically designed for this study were used to collect data on the date, time, feedback recipient, form, and content of feedback stimuli delivered to staff. This method of tracking feedback stimuli may allow for more natural delivery. Independent researchers will collect primary data on feedback stimuli delivered to direct-care staff based on the feedback stimulus listed in Table 3.

Table 3

*Types of Feedback Content*

Feedback Stimulus	Definition	Example
Objective	Specific measurable information about prior performance independent of performance	“you scored a 71% on your session tasks,” “you completed 4 tasks”
Supportive evaluative	Relative information about prior performance compared to standard when criterion was met	“looks good,” “you completed tasks correctly,” “keep up the good work”
Critical evaluative	Relative information about prior performance compared to standard when criterion was NOT met	“there’s some room for improvement,” “you can do a little better next time”
Affirmative	Behavior-specific praise for performances completed correctly with objective information on performance	“great work entering start and mastered dates; you got an 81% on your end of appointment task completion”
Corrective	Behavior-specific reprimands for performances completed incorrectly with objective information on performance	“you could do better initialing notes in the binder; you got an 81% on your session tasks”

*Notes.* Feedback content definitions and examples of each type of feedback content.

## Results

### **Feedback Stimulus Preference Assessment**

The a-priori assessment of feedback stimuli assessed preference for various components and characteristics of performance feedback including source, privacy, immediacy, medium, and content. The results of the assessment were used to develop a descriptive analysis of feedback procedures and are depicted in Figures 1 and 2. The results indicated that all participants shared similar preferences. All participants preferred to receive immediate performance feedback with four participants preferring feedback from a supervising behavior analyst and three preferring peer feedback. Only one participant identified written feedback as a preferred form of delivery with all others preferring vocal verbal feedback.

### **Overall Feedback Component Preference**

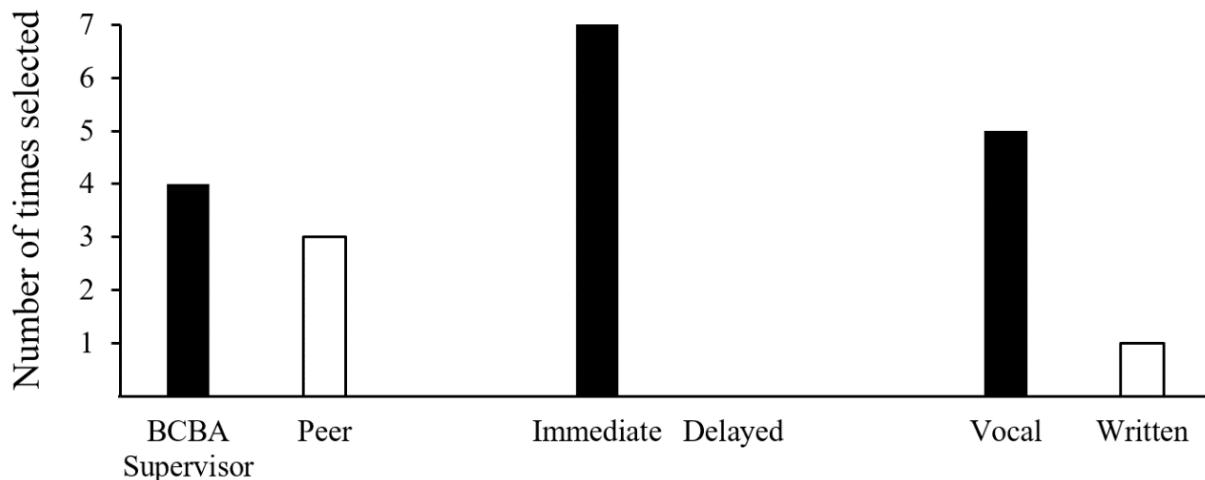


Figure 1. Overall preferred feedback components identified through the feedback stimulus preference assessment. Items farther to the left of the graph are more preferred

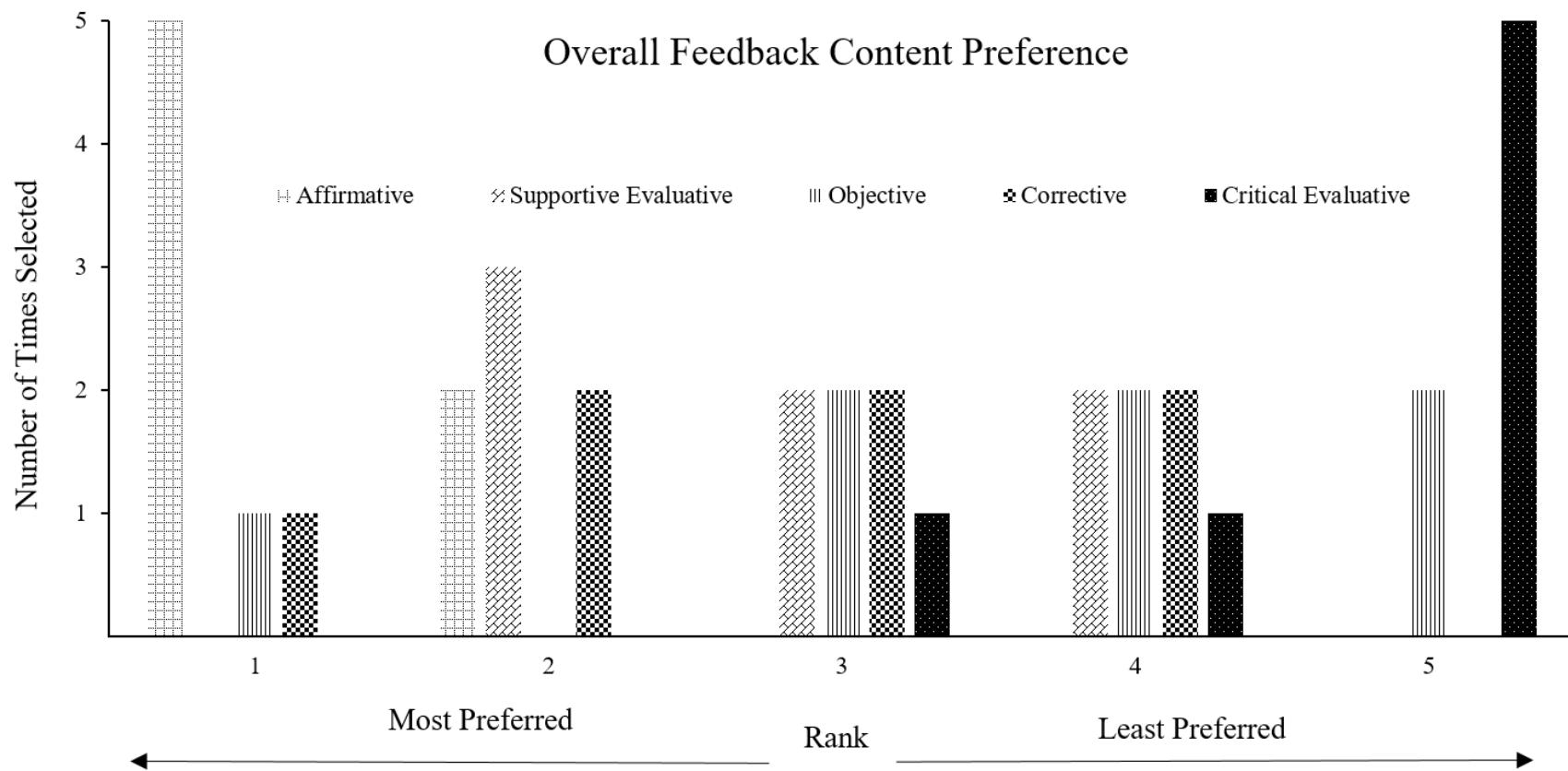
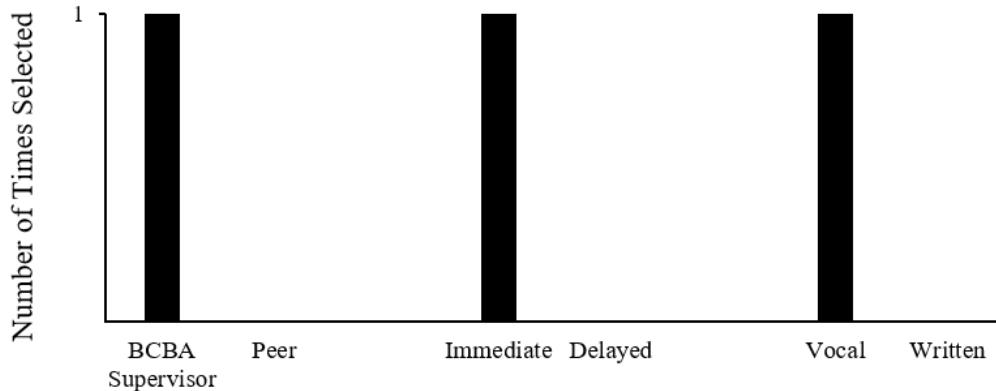
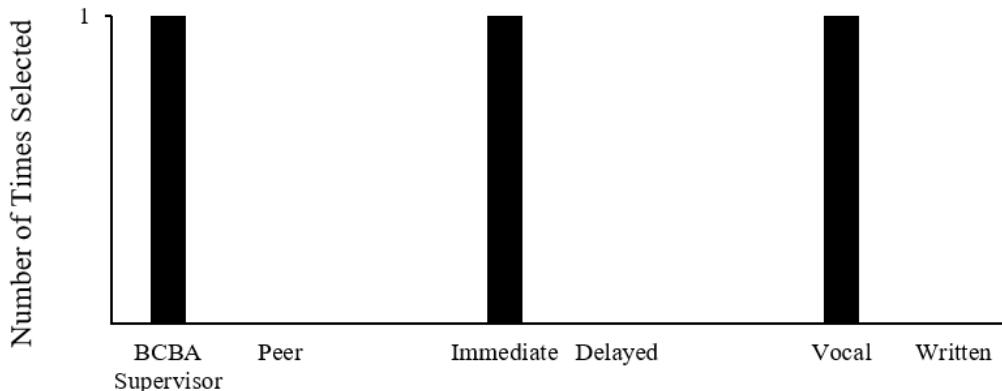


Figure 2. Individual preferred feedback components for Ray, Lana, and Mallory identified through the feedback stimulus preference assessment

Ray Feedback Component Preference



Lana Feedback Component Preference



Mallory Feedback Component Preference

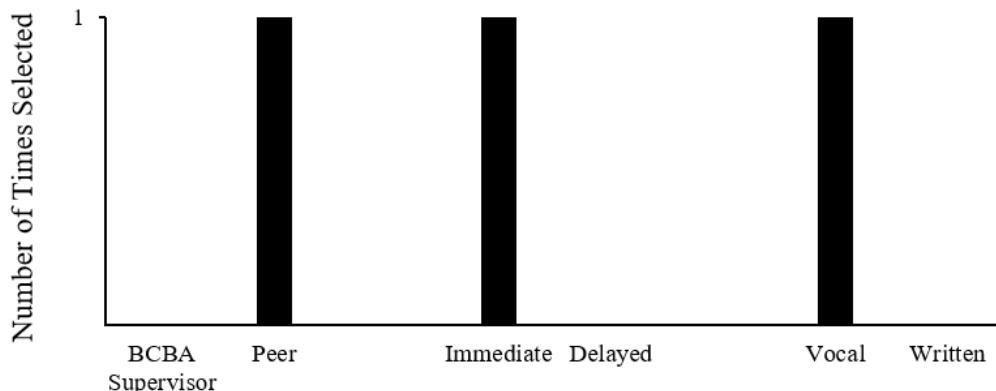


Figure 3. Individual preferred feedback components for Ray, Lana, and Mallory identified through the feedback stimulus preference assessment

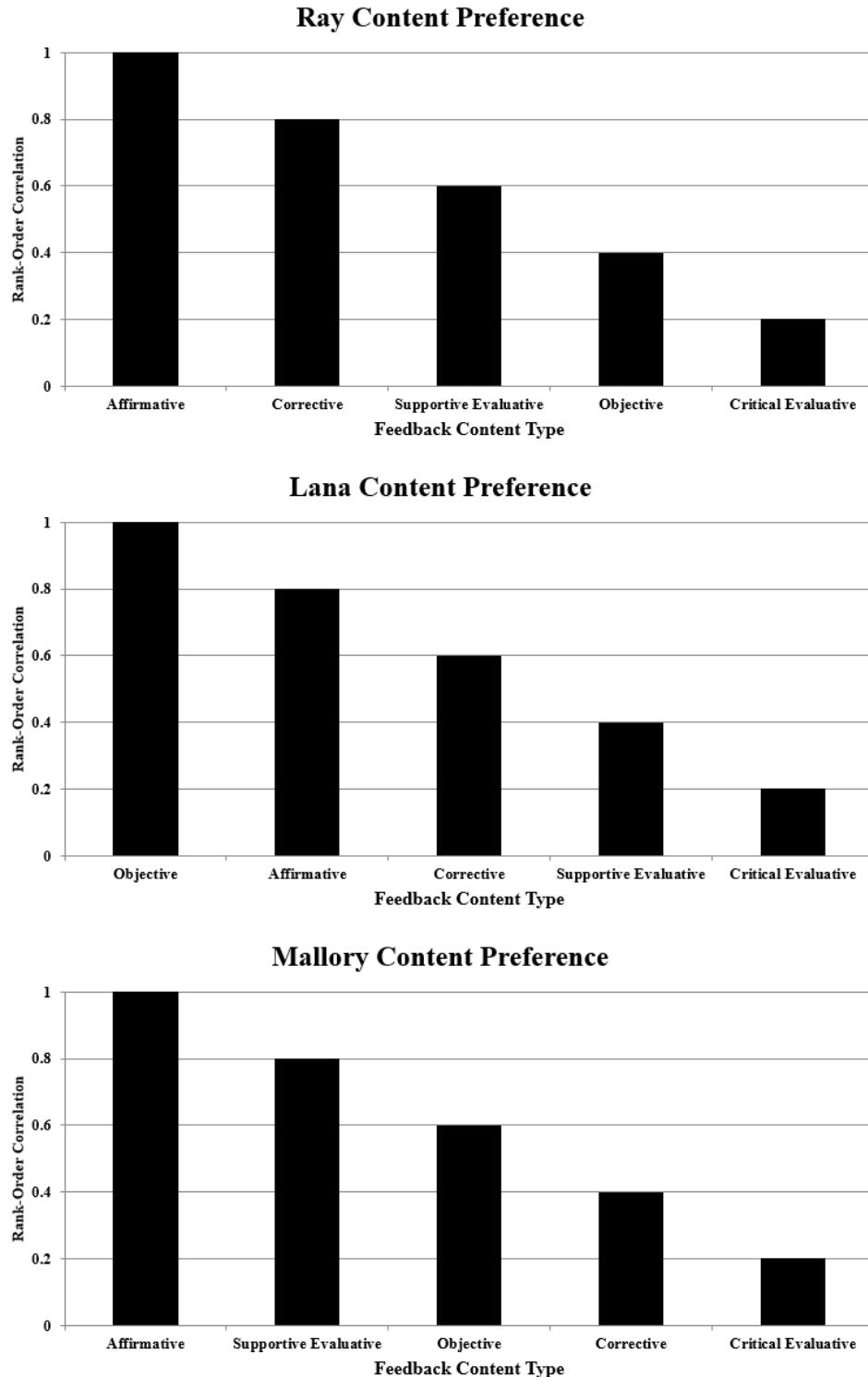
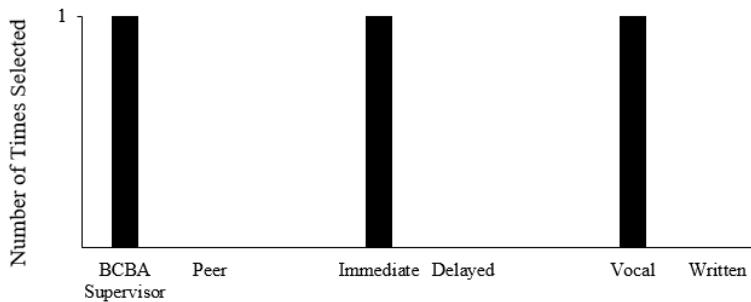


Figure 4. Individual preferred feedback content for Ray, Lana, and Mallory identified through the feedback stimulus preference assessment

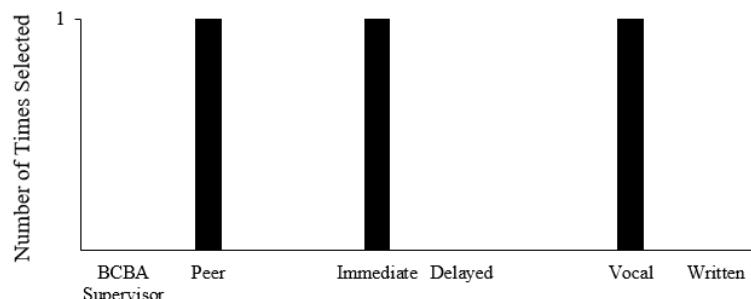
Cyril Feedback Component Preference



Katya Feedback Component Preference



Cherlene Feedback Component Preference



Sterling Feedback Component Preference

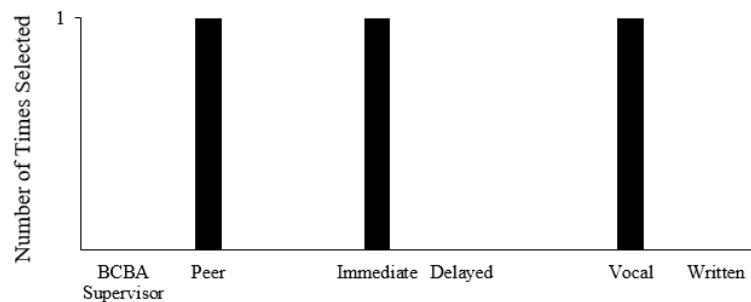


Figure 5. Individual preferred feedback components for Cyril, Katya, Cherlene, and Sterling identified through the feedback stimulus preference assessment

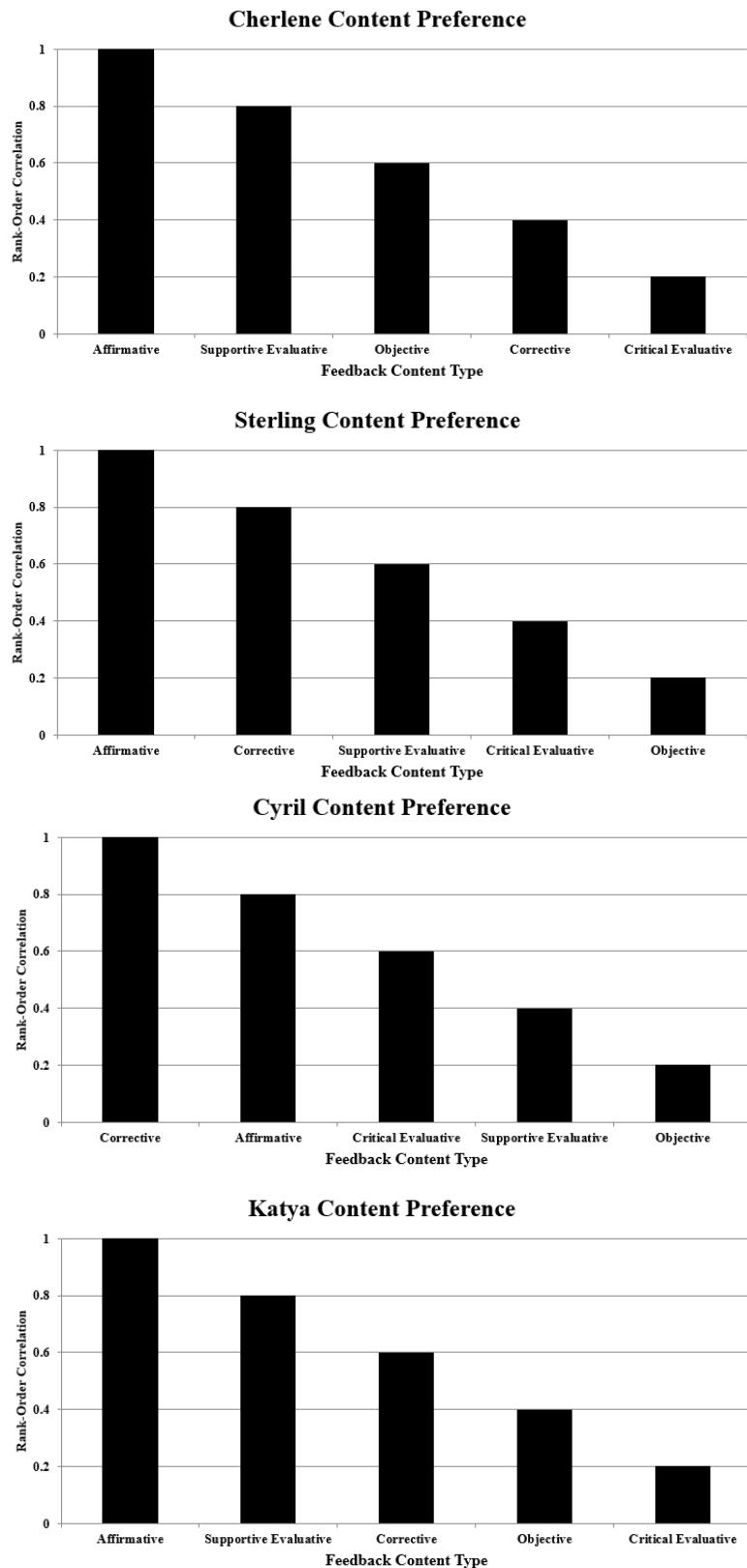


Figure 6. Individual preferred feedback content for Cyril, Katya, Cherlene, and Sterling identified through the feedback stimulus preference assessment

Results of the feedback intervention suggest that receiving preferred performance feedback has a potential to improve independent task completion. Most notably, preferred feedback was most effective when it consisted of detailed, behavior-specific, affirmative performance feedback. Overall performance completion rates are included in Figures 3 and 4.

**Ray.** The results of Ray's preference assessment indicated that immediate, affirmative, written feedback from a supervising behavior analyst was the most preferred combination of feedback stimuli. Ray ranked the feedback content from highest to least preferred as follows: affirmative, corrective, supportive evaluative, objective, and critical evaluative. When preferred feedback stimuli were delivered, Ray exhibited a significant level change between baseline and intervention. Baseline data were variable with a clear increasing trend followed by a significant decreasing trend. Feedback was delivered during the fifth session at which point a significant increase in the level of performance was observed. Data remained relatively stable during the first phase of intervention, however performance began to gradually worsen at which point the participant was given the checklist of performance tasks that included audit data for the previous session. After the checklist with a higher density of performance feedback was introduced, an upward level change was observed as completion rates improved and reached mastery criteria of three consecutive sessions with 100% task completion. Performance data for Ray indicate a relatively strong experimental control for the effectiveness of this specific feedback intervention.

**Lana.** The results of Lana's preference assessment indicated that immediate, objective, vocal feedback from a supervising behavior analyst was the most preferred feedback stimulus combination. Lana ranked the feedback content from highest to least preferred as follows: objective, affirmative, corrective, supportive evaluative, and critical evaluative. Data indicate high variability during baseline performance. While the first three sessions demonstrated a low

level of task completion during baseline, performance improved coincidentally during the fourth session when feedback was delivered. While data may indicate an increasing trend for Lana's performance, preferred feedback did appear to stabilize performance at a consistently higher level. Additional data or modifications to the feedback components used in intervention are needed to demonstrate a stronger causal relationship for feedback's effects on performance for this individual.

**Mallory.** The results of Mallory's preference assessment indicated that immediate, affirmative, vocal feedback from a peer was the most preferred feedback stimulus combination. Mallory ranked the feedback content from highest to least preferred as follows: affirmative, supportive evaluative, objective, corrective, and critical evaluative. Baseline performance showed moderately low levels of task completion during the first three sessions of baseline. Task completion reached 100% after the first feedback session, however dropped in the following session. While there was a slight increase in level, further data are needed to show efficacy of preferred feedback for this participant.

**Pam and Cyril.** Pam did not respond to the feedback stimulus preference assessment survey that was sent, therefore, no data were collected on preference to be used in a feedback intervention. The results of Cyril's preference assessment indicated that immediate, corrective, vocal feedback from a supervising behavior analyst was the most preferred feedback stimulus combination. Cyril ranked the feedback content from highest to least preferred as follows: corrective, affirmative, critical evaluative, supportive evaluative, and objective. Baseline data for Pam and Cyril indicate future possibility of intervention. Data for Pam show variable responding at moderate to high levels during baseline. Further baseline collection and identification of preferred feedback stimuli are needed for Pam to establish a stable trend of

responding before continuing to intervention. Baseline data for Cyril show relative stability at low-moderate completion rates and indicates readiness for intervention, however intervention was not pursued due to scheduling limitations.

**Katya, Sterling, and Cherlene.** The results of Katya's preference assessment indicated that immediate, affirmative, vocal feedback from a supervising behavior analyst was the most preferred feedback stimulus combination. Katya ranked the feedback content from highest to least preferred as follows: affirmative, supportive evaluative, corrective, objective, and critical evaluative. Cherlene's preference assessment indicated that immediate, affirmative, vocal feedback from a peer was the most preferred feedback stimulus combination. Cherlene ranked the feedback content from highest to least preferred as follows: affirmative, supportive evaluative, objective corrective, and critical evaluative. Sterling's preference assessment indicated that immediate, affirmative, vocal feedback from a peer was the most preferred feedback stimulus combination. Sterling ranked the feedback content from highest to least preferred as follows: affirmative, corrective, supportive evaluative, critical evaluative, and objective. These three participants were determined ineligible for intervention based on high levels of baseline performance. Baseline data for Katya indicate a relatively stable and high level of performance. Despite a slight decreasing trend in the last two sessions of baseline data collection, intervention was not pursued due to the overall high level of responding during the baseline condition. Data for Sterling indicate moderate variability with a distinctive downward trend immediately followed by an upward trend in overall task completion. Baseline data for Cherlene indicate slight variability in responding at moderately high levels. Extended data collection during baseline was completed to establish a more stable trend in responding, however performance began to improve over time without intervention.

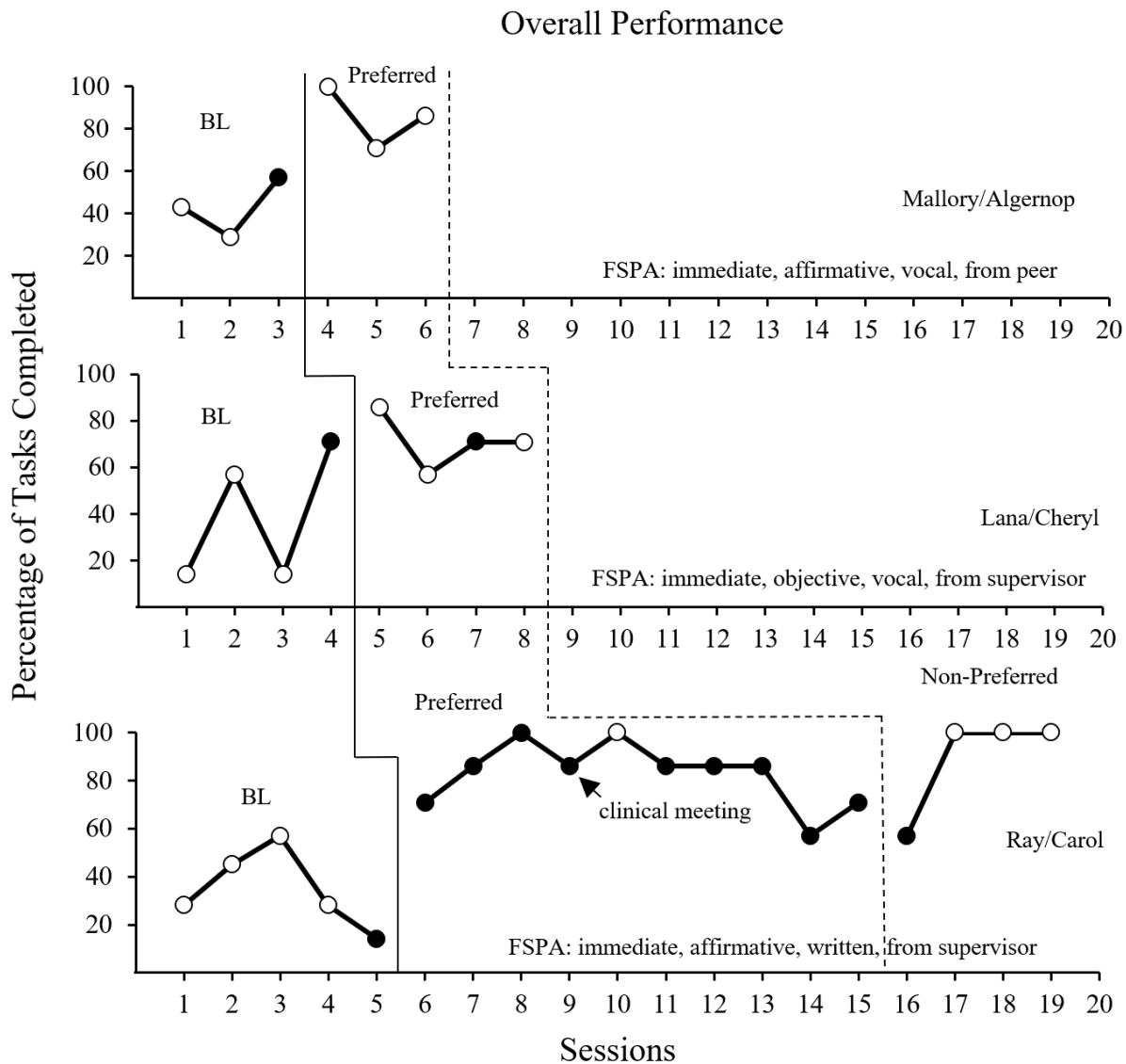


Figure 7. Performance data depicting overall session task completion per session. Open circles indicate sessions where feedback was not delivered, and closed circles indicate sessions where feedback was delivered. The delivery of feedback during a clinical meeting is noted in the graph.

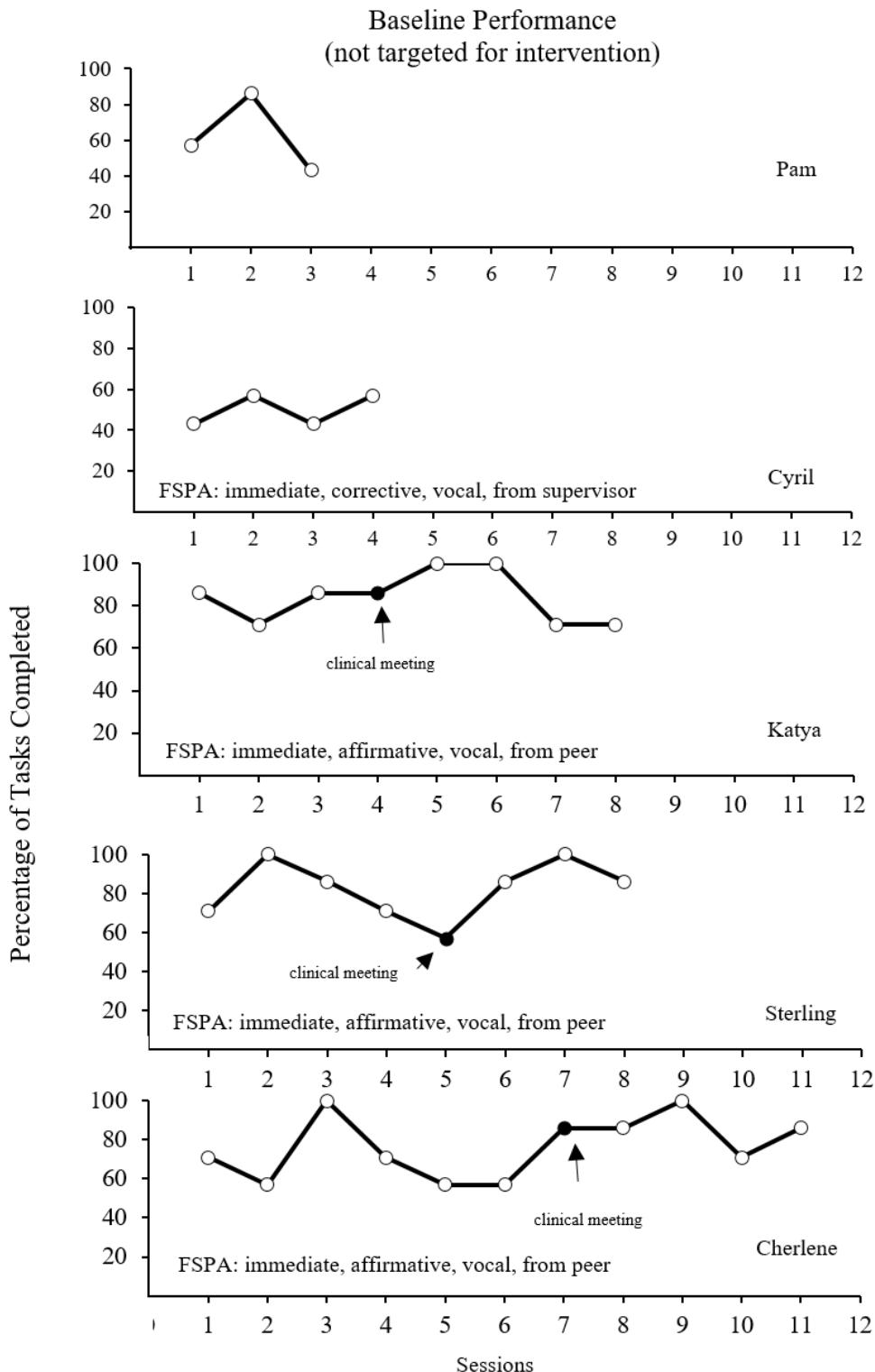


Figure 8. Baseline data of participants excluded from the study. Open circles indicate sessions where feedback was not delivered, and closed circles indicate sessions where feedback was delivered. The delivery of feedback during a clinical meeting is noted in the graph.

## **Discussion**

The purpose of this study was to collect data on current rates of task completion and feedback procedures and to change performance in existing feedback interventions by altering the feedback stimuli being used. The primary focus was to identify specific components and types of feedback stimuli to be used in an individualized performance feedback delivery system. Results of the feedback stimulus preference assessment indicate that the participants in this study had relatively similar preferences for the components typically used in feedback interventions. A strong preference for affirmative feedback and aversion to critical evaluative feedback was noted in the feedback stimulus preference assessment. This may be a significant component of feedback interventions that should be evaluated in future research. It is possible that behavior-specific feedback, whether affirmative or corrective, may strengthen individual performance for tasks that are not clearly defined or understood by the performer. For instance, one participant in this study identified objective feedback (i.e., task completion percentage per session) only as the most preferred feedback stimulus. Based on this preference, no additional information was provided on which tasks were to be completed, or whether or not performance met any criteria. The lack of specificity regarding performance expectations or how to perform specific tasks likely impacted overall performance and task completion. Providing objective feedback stimuli alone is likely not effective at improving low rates performance when the individual is unaware of the expectations. Therefore, additional behavior-specific feedback provided in affirmative or corrective feedback (i.e., specific evaluative feedback stimuli) may be more effective at augmenting the value objective feedback. Specifically, using checklists for complex tasks and scheduling preferred feedback sessions that align with required supervision requirements are recommended as techniques for feedback delivery.

This study further expanded research on the behavioral function of feedback stimuli by comparing the effects of preferred feedback stimuli on performance. While “content” was considered a component of feedback, the specific properties of the content may have a function-altering effect on the feedback stimulus. The identification of preference for feedback stimulus content on individual performance is a strength of this study that can further examined to determine the reinforcing effectiveness of different types preferred feedback content on individual performance and task completion. By identifying types of feedback content that are highly preferred, the use of feedback stimulus delivery tracking systems may also meet ethical obligations to ensure the delivery of effective performance feedback.

It is worth noting that all feedback delivered during intervention is considered “positive” feedback in that feedback stimuli were never removed contingent upon performance. For example, corrective feedback under this paradigm would be considered “negative” feedback if the corrective feedback ceased to be delivered contingent upon the performance meeting a pre-determined criterion. That is, it would be removed if it was typically present. Additionally, negative-affirmative feedback would be exemplified by contingent non-delivery of affirmative feedback (e.g., behavior specific praise) when performance *does not* meet a pre-determined criterion. Because of this, it is suggested that a more functional use of feedback terminology be adopted for academic study and professional use. Investigation into feedback procedures’ underlying behavioral function can be used to improve clinical treatment outcomes by addressing performance problems in direct-care providers. It may also provide additional insight into how specific feedback stimuli can be used functionally, possibly identifying effective mechanisms of feedback delivery.

## Limitations and Confounds

There are several limitations in part due to the clinical setting and applied nature of the study. Because of the similarities in preference, larger sample sizes are needed to further demonstrate the effects of preferred performance feedback stimuli. Without larger sample sizes with a wider variety of preferences, it cannot be determined whether preferred feedback improves performance, or if specific types of content are responsible. While it is suggested that certain components or types of content are more effective at improving performance, future component analyses should be conducted to identify whether the combination of preferred performance feedback stimuli are effective at improving performance, or if certain types of content (e.g., affirmative or corrective) are responsible for improved performance.

This study also suffered from limited opportunities of data collection. Behavior technicians in this study averaged six sessions per week with some sessions determined as ineligible for data collection per clinical policies in scheduling. This led to only a few performances a week that were eligible to be audited. This combined with scheduling changes (e.g., client cancellations, session coverage, etc.), limited data collection. Additionally, participants in this study were all full-time graduate students who were likely highly motivated to participate in the study. With this in mind, it is likely that the participants in this study or other behavior technicians may have completed data collection tasks for other participants influencing the rates of task completion.

Beyond the limitations of staff and clinical schedules, one confounding limitation may be the nature of supervisory relationships. While behavior technicians' performance was the behavior targeted for intervention, the inclusion of a supervisory dyad in the study required supervising behavior analysts to alter their own behavior as part of the intervention. In essence,

this required supervising behavior analysts to be additional participants in the intervention process. Implementing interventions in collaboration with direct supervisors creates a host of limitations. For example, supervisors needing to withhold specific feedback if not indicated by study procedures, supervisors' repertoire of delivering feedback affecting their performance, and communication barriers related to when and how feedback is given. While a formal social validity assessment was not administered as part of this study, it is important for future research to address social validity concerns given the nature of feedback interventions. A formalized social validity assessment may have moderated the limitations encountered during the study.

Additionally, graphic feedback was delivered after a few points into intervention for one participant because data was presented at a clinical meeting. Graduate researchers were required to present research presentations when scheduled by supervising behavior analysts. While data were deidentified, it was possible participants identified their own data, likely influencing responding. Finally, behavior analysts provided written, corrective, group feedback on performance DV's delivered through email multiple times after intervention had started. It is likely these limitations and confounds directly or indirectly altered behavior technician performance and led to extended and incomplete baselines.

## **Future Research**

Future research should further evaluate the types of feedback content proposed in this study in addition to the underlying behavioral function(s) that feedback stimuli may serve. This investigation into can be used to improve clinical treatment outcomes by addressing performance problems in direct-care providers. Prior research suggests stimuli with closer temporal proximity to future responding was likely to function as an antecedent stimulus for subsequent responding, as opposed to a consequence for prior responses. This raises questions regarding feedback's role

as a conditioned motivating operation and if feedback has acquired evocative or behavior-altering effects through continued stimulus pairing. By isolating both feedback content and delay, a relation between feedback content and functional mechanism may possibly be identified.

RBT:

Supervisor:

Date & Session Time:	Behavior(s) (check all that apply)	Match?	Content* (circle ONE)	Match?	Form	Match?	Immediate or Delayed	Match?	Source	Match?	Fidelity %
	<input type="checkbox"/> Completion percentage <input type="checkbox"/> Notes initialed <input type="checkbox"/> Start date entered <input type="checkbox"/> Mastered date entered <input type="checkbox"/> Maintenance cards made <input type="checkbox"/> Data sheets correct <input type="checkbox"/> Old data sheets filed <input type="checkbox"/> New data sheets prepared	Y N	Objective Supportive evaluative Critical evaluative Affirmative Corrective	Y N	Vocal Written	Y N	Immediate Delayed	Y N	Peer Supervisor	Y N	
	<input type="checkbox"/> Completion percentage <input type="checkbox"/> Notes initialed <input type="checkbox"/> Start date entered <input type="checkbox"/> Mastered date entered <input type="checkbox"/> Maintenance cards made <input type="checkbox"/> Data sheets correct <input type="checkbox"/> Old data sheets filed <input type="checkbox"/> New data sheets prepared	Y N	Objective Supportive evaluative Critical evaluative Affirmative Corrective	Y N	Vocal Written	Y N	Immediate Delayed	Y N	Peer Supervisor	Y N	
	<input type="checkbox"/> Completion percentage <input type="checkbox"/> Notes initialed <input type="checkbox"/> Start date entered <input type="checkbox"/> Mastered date entered <input type="checkbox"/> Maintenance cards made <input type="checkbox"/> Data sheets correct <input type="checkbox"/> Old data sheets filed <input type="checkbox"/> New data sheets prepared	Y N	Objective Supportive evaluative Critical evaluative Affirmative Corrective	Y N	Vocal Written	Y N	Immediate Delayed	Y N	Peer Supervisor	Y N	
	<input type="checkbox"/> Completion percentage <input type="checkbox"/> Notes initialed <input type="checkbox"/> Start date entered <input type="checkbox"/> Mastered date entered <input type="checkbox"/> Maintenance cards made <input type="checkbox"/> Data sheets correct <input type="checkbox"/> Old data sheets filed <input type="checkbox"/> New data sheets prepared	Y N	Objective Supportive evaluative Critical evaluative Affirmative Corrective	Y N	Vocal Written	Y N	Immediate Delayed	Y N	Peer Supervisor	Y N	
	<input type="checkbox"/> Completion percentage <input type="checkbox"/> Notes initialed <input type="checkbox"/> Start date entered <input type="checkbox"/> Mastered date entered <input type="checkbox"/> Maintenance cards made <input type="checkbox"/> Data sheets correct <input type="checkbox"/> Old data sheets filed <input type="checkbox"/> New data sheets prepared	Y N	Objective Supportive evaluative Critical evaluative Affirmative Corrective	Y N	Vocal Written	Y N	Immediate Delayed	Y N	Peer Supervisor	Y N	
	<input type="checkbox"/> Completion percentage <input type="checkbox"/> Notes initialed <input type="checkbox"/> Start date entered <input type="checkbox"/> Mastered date entered <input type="checkbox"/> Maintenance cards made <input type="checkbox"/> Data sheets correct <input type="checkbox"/> Old data sheets filed <input type="checkbox"/> New data sheets prepared	Y N	Objective Supportive evaluative Critical evaluative Affirmative Corrective	Y N	Vocal Written	Y N	Immediate Delayed	Y N	Peer Supervisor	Y N	

#### Feedback Definitions:

Objective:  
Specific measurable information about prior performance

Supportive evaluative:  
relative info about prior performance compared to standard when criterion is met

Critical evaluative:  
relative info about prior performance compared to standard when criterion is NOT met

Affirmative-  
(combined objective and supportive evaluative): behavior-specific praise for performances completed correctly w/ objective information on performance

Corrective- (combined objective and critical evaluative): behavior-specific reprimands for performances completed incorrectly w/ objective information on performance

## Appendix 1

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